WATER MANAGEMENT IN ALBERTA

CHALLENGES FOR THE FUTURE

BACKGROUND PAPER

VOLUME 9

ENVIRONMENTAL IMPACT ASSESSMENT

Alberta
ENVIRONMENT

ISBN: 0-7732-0646-9
August 12, 1991

Printed on Recycled Paper

SUMMARY

VOLUME 9: ENVIRONMENTAL IMPACT ASSESSMENT

CHAPTER 1: ENVIRONMENTAL IMPACT ASSESSMENT

Volume nine provides information about environmental impact assessments (EIAs): what they are, their scope and application, and the issues that surround them.

Environmental impact assessment (EIA) is a process that aids in the early identification and evaluation of the effects of proposed economic developments on the biophysical and human environment. Its purpose is to ensure that only environmentally sound projects proceed into the development phase. The protection and wise management of Alberta's water resources are areas where EIAs play a role.

Over the years, the role of the EIA has changed from just considering biophysical or ecological impacts in an objective way to considering social and economic impacts as well.

The legislation enacting EIAs reflects these changes. From the early '70s when an environmental regulatory framework was first created to the 1990's and the proposed ***Alberta Environmental Protection and Enhancement Act (AEPEA)*** , the importance of the EIA has grown. Pressures on the environment and environmental problems have become more complex. These issues concern people, and they want to play a greater and more active role in environmental decision-making.

Currently, the Minister of Environment has the discretion to require an EIA if, in his/her opinion, the development will have significant adverse environmental impacts. Government policy requires EIAs for projects such as pulp mills, oil sands recovery schemes, coal mines, thermal or hydro-power generation projects, major water management projects and other developments.

The proposed AEPEA would set up a formal environmental assessment process for reviewing development activities to determine their environmental effects. The regulations of the AEPEA would identify major resource projects that would be subject to mandatory review under the environmental assessment process.

The proposed Act would establish criteria and a process for screening other activities with potentially adverse environmental effects including those requiring an approval under the ***Water Resources Act.***

The challenge that lies ahead will be to develop effective procedures at all levels of decision-making that link economic development to environmental protection and the maintenance of ecological integrity.

Printed on Recycled Paper

91-06969/

TABLE OF CONTENTS

VOLUME 9: ENVIRONMENTAL IMPACT ASSESSMENT

Summary

Chapter 1: Environmental Impact Assessment 1

Printed on Recycled Paper

ENVIRONMENTAL IMPACT ASSESSMENT

INTRODUCTION

What is Environmental Assessment?

Environmental assessment, a multi-disciplinary decision-making tool, evaluates the effects of human activities on natural and human environments. It has widespread application for the analysis and screening of policies and programs, resource evaluation for regional planning and modelling, and monitoring for cumulative changes in natural and managed ecosystems. Most often, however, formalized environmental assessment procedures have evaluated the ecological and socio-economic effects of resource development projects and industrial facilities. In Alberta, this has seen the evolution of a legislated Environmental Impact Assessment (EIA) process that facilitates the early identification and evaluation of potentially significant effects of proposed economic developments on the biophysical and human environment. The results of the EIA help to determine project acceptability.

Why is it Important?

Environmental assessment has particular relevance to the protection and wise management of Alberta's water resources. A number of human activities, if not planned properly, can affect the integrity of aquatic and riparian ecosystems, human well-being and the economic, social, recreational and aesthetic values associated with rivers, lakes and streams. These effects are largely a result of changes in water quality and water quantity and the modification of natural streamflow patterns. They arise directly as a result of the disposal of thermal and chemical effluents by municipalities, industry, recreational facilities, agriculture and thermal power plants, as well as the withdrawal of water from lakes, rivers and groundwater sources for irrigation, industry, heavy oil extraction and domestic and municipal uses. Within river basins, land-use practices such as agriculture, recreation, mining and forestry can also indirectly affect water quality and quantity.

Water management projects have been developed largely by the Alberta Government to manage lakes and streams in order to meet the needs of a variety of users. In southern Alberta, on-stream and off-stream dams, diversion structures and canals have been built to support irrigation and to ensure water supplies for industry, domestic and municipal uses. In northern and central Alberta, flood control and flow augmentation reservoirs, river training and lake stabilization structures, as well as drainage projects support the needs of agriculture, thermal power generation, heavy oil extraction, recreation, industry and domestic and municipal uses. On-stream hydro-electric dams constructed by utility companies regulate streamflows in the headwaters of the Bow and North Saskatchewan river basins. While such projects provide great benefits to Albertans, they can also affect the environment by regulating streamflow patterns, modifying stream morphology and impounding water.

These projects may have far-reaching effects in terms of both space and time: the linear extent of river basins and groundwater flows affect large areas, while the engineered life of water management and hydroelectric structures, as well as the recovery time needed for aquatic and riparian ecosystems, may extend over a long period.

As greater demands are placed on our water resources, impacts will increasingly occur as a result of the combined or cumulative effects of several activities within a basin. Individually, these activities may result in minor or localized impacts. However, taken together, they may impair environmental quality.

Printed on Recycled Paper

BACKGROUND

The Scope of Environmental Assessment

Environmental assessment was spawned from the environmental consciousness of the 1960s. Through the 80s, there has been widespread acceptance of the concept and use of environmental assessment. The framework of development planning has been extended beyond traditional objectives of economic efficiency and technical feasibility. Through environmental assessment procedures, planning now frequently includes the prediction of future changes in environmental quality and the valuation of these changes. In its earlier applications, EIA considered only biophysical or ecological impacts. Today, however, since a broader definition of environment is generally recognized, EIAs encompass functional and aesthetic attributes of natural systems that sustain and enrich human life. Social, cultural, economic and health effects are now commonly evaluated in most assessments.

Environmental assessment has both objective and subjective components. The objective component deals with empirical observations and falls within the realm of the natural and physical sciences, as well as socio-economic disciplines. It predicts the resulting ecological and social effects a project will have on the natural and human environment. On the other hand, the subjective component deals with values. It compares the diverse array of predicted environmental and socio-economic effects in order to measure the overall impact on environmental quality and to weigh environmental impacts against societal considerations.

The significance of environmental impacts depends on the frame of reference of various individuals, groups and institutions within society. Most jurisdictions recognize the need for broad-based public involvement in the EIA process. Such involvement allows a wider range of values to be considered in determining project acceptability.

To be an effective and efficient decision-making tool, assessment procedures should be initiated during the early stages of project-planning. Early implementation of assessment procedures allows for the selection of alternative sites, designs and operational procedures which may maximize the benefits of the project or activity and minimize environmental impacts. Early implementation also allows adequate time for conducting assessment studies, thus improving the quality of data upon which environmental decisions are made.

Legislation

Governments in North America and elsewhere responded to increasing public concerns about the environment in the late 60s and early 70s by establishing institutions principally responsible for environmental matters and by enacting legislation aimed at protecting the environment. Government actions were organized to regulate development and to establish regulatory procedures for assessing the effects of development on the environment.

The Alberta Government established a policy of environmental legislation in the early 70s that would allow for the orderly development of resources with a minimum of environmental damage. At that time, there was a real need for an EIA process due to the unprecedented number and variety of resource initiatives being planned, and because of growing demands from the public for input into the decisions being made about these projects. An environmental regulatory framework was being put into place, and with the passage of the ***Land Surface Conservation and Reclamation Act*** in 1974, referral mechanisms co-ordinated by Alberta Environment were established to ensure co-ordinated review and approval of resource developments. Section 8 of the Act contains provisions requiring EIAs for larger developments with the potential to significantly affect the environment.

The Alberta Government opted for a flexible approach to EIA based on guidelines, rather than the more prescriptive system based on regulations practised in some of the other provinces. In May, 1974, Alberta Environment initiated development of guidelines to assist proponents with the preparation of EIAs. In 1975, with the assistance of an environmental consultant and suggestions received from twenty-six Government agencies, Alberta Environment adopted interim guidelines for the preparation and submission of EIA reports. Following two years of practical experience on a variety of projects, the interim guidelines were officially adopted as policy directives in 1977. In 1978, the guidelines were modified to outline specific requirements for the identification of project impacts on the community, and to outline more specifically expectations regarding public involvement in the preparation of EIAs.

In 1979, a Steering Committee composed of representatives from resource development areas, industry and Alberta Environment was established to review the EIA process. The recommendations of the Committee were incorporated into the EIA requirements contained in Energy Resources Conservation Board (ERCB) application guidelines, which were developed for energy-related projects in 1981. The recommendations were also incorporated into the current EIA guidelines which were first published in 1985.

Application

Resource development approval in Alberta is worked out in stages. Conceptual-level evaluations such as EIAs lead to more detailed resource-use and environmental approvals (permits and licences) which are issued by a number of Government agencies. This includes approvals issued under the ***Water Resources Act***. Conditions are often attached to these approvals which reflect recommendations made in EIAs to protect the environment.

The Minister of Environment has the discretion to require an EIA if, in his/her opinion, the development will have significant adverse environmental impacts. Factors such as project size and location, technology, environmental sensitivity, public concern and project complexity are considered in determining whether or not an EIA is required. EIAs are required, however, as a matter of government policy on the following types of projects: oil sands recovery schemes, coal mines, thermal or hydro-power generation projects, refineries and petro-chemical plants, sour gas plants, transmission lines, pipelines, recreation complexes and major water resource developments.

Proponents of developments (including the Government) that are likely to result in significant environmental impacts are required to contact Alberta Environment as early as possible in their project planning. Other projects may also come to the attention of the Minister through referrals from elected officials, members of the general public or other Government agencies. Projects are then screened by the Department to determine whether or not an EIA is required. If an EIA is not required, the proposal is processed through existing permit and licensing procedures.

When an EIA is required, the project is examined to determine the appropriate level of detail for its scope and content. The scoping process is often undertaken jointly between Alberta Environment and the proponent, and often involves input from the public. The proponent then begins gathering data and conducting research which will determine the potential environmental impacts of the proposed project. The proponent must present information which identifies existing conditions, assesses possible negative impacts and demonstrates how these impacts will be mitigated. The proponent must also clearly identify any residual impacts that cannot be mitigated. When the necessary information has been obtained, the proponent prepares the EIA report and informs the public that the document is available for review. This procedure allows the public to see how their concerns have been addressed and gives the proponent an opportunity to confer with the public before submitting the report to Alberta Environment.

Printed on Recycled Paper

Alberta Environment coordinates an interdepartmental review of the EIA to identify informational deficiencies. These deficiencies are communicated to the proponent, who then prepares supplemental information. The EIA report is considered complete after all of the requirements of the EIA have been met and the deficiencies addressed to the satisfaction of Alberta Environment.

In the case of major energy-related projects, the EIA is filed with Alberta Environment, and as part of the application to the ERCB. Once all deficiencies in the EIA have been addressed to the satisfaction of Alberta Environment, the application and supplemental information are subject to a public hearing conducted by the ERCB.

More than 125 projects have been reviewed under the Alberta EIA process since its introduction in 1974. A large number of these focused on potential impacts to water resources. Prime examples include the EIAs prepared by oil companies for heavy oil extraction in the Cold Lake-Beaver River area. These EIAs gave extensive consideration to the impacts of withdrawing water for steam injection from aquifers, lakes and streams in the region. Based on the heavy demand for water and the potential for significant environmental impacts, Alberta Environment developed the Cold Lake-Beaver River Water Management Plan. This plan, produced after extensive environmental research and consultation with area residents, placed limits on the amount of water that could be withdrawn from lakes, streams and groundwater sources in the area. It also recommended that a pipeline be built to supply water from the North Saskatchewan River to meet water demands after these limits had been reached.

In the past two years, formal EIAs have been initiated for three water management projects proposed by the Alberta Government: the Little Bow River Project/Highwood River Water Management Plan; the Pine Coulee Reservoir; and the Parlby Creek-Buffalo Lake Water Management Project. Recently, EIAs have also been prepared for a number of tourism and recreational (golf course) development projects. These EIAs have specifically addressed potential water-related impacts.

Reform

Environmental values and concerns have changed dramatically since 1971, when the Alberta Department of the Environment was established, and since 1974, when the EIA process was incorporated into the ***Land Surface Conservation and Reclamation Act.*** Pressures on the environment and environmental problems have become more complex with technological and societal changes in the past twenty years. People are now more concerned about environmental issues and want to play a greater and more active role in environmental decision-making. In recognition of these facts, the Alberta Government embarked on a program to reform legislation, including the EIA process, beginning in early 1990.

In January, 1990 Alberta Environment widely distributed copies of the Government's vision document on the environment entitled "Alberta's Environment - Toward the 21st Century". More than 5,000 Albertans responded by letter to the invitation for public comments contained in the vision document. These comments and opinions on the environment were summarized in the document "Thanks From Alberta Environment". This included comments pertaining to the EIA process.

At about the same time, an EIA Task Force was established and given the mandate to explore and recommend ways and means of evaluating and assessing future natural resource developments through a new Environmental Assessment process and accompanying legislation. Key recommendations of the Task Force included the right of the broad public to participate in all phases of the Environmental Assessment process; the need for comprehensive legislation; the need for post-project monitoring; the establishment of an independent board to review EIAs; and the expansion of the Environmental Assessment process to examine new Government policies and initiatives with environmental implications. These recommendations, along with public comments on the

environmental vision document, were considered in the development of a proposed new environment Act - the ***Alberta Environmental Protection and Enhancement Act*** (AEPEA).

A discussion draft of the proposed AEPEA was made available to the public in June, 1990. From October to December, 1990, an Environmental Legislation Review Panel held public meetings throughout the province providing the public with the opportunity to express their views on the draft legislation. In January, 1991, the Panel presented a report summarizing public comments and making recommendations for changes to the proposed legislation in twenty-two areas. All of the Panel's recommendation were considered during a re-drafting phase, and on June 20th, 1991, a revised draft of the proposed AEPEA was introduced in the Alberta Legislature.

The proposed AEPEA would consolidate eight existing environmental Acts, including the ***Land Surface Conservation and Reclamation Act***, along with sections of the ***Department of the Environment Act***. The ***Water Resources Act***, because of its complexity and long history, is being reviewed under a separate process for which this paper and others have been prepared. As water is an integral part of the environment, the proposed AEPEA has been written such that the province's water management legislation could eventually be incorporated.

The proposed AEPEA would establish a formal Environmental Assessment process for reviewing the environmental effects of development activities. The regulations of the AEPEA would identify a number of major resource projects that would be subject to mandatory review under the Environmental Assessment process. Various Government Departments are currently reviewing resource projects under their jurisdiction to identify those that will be subject to mandatory review, including review of water management projects by Alberta Environment. Discussions to date within the Department have identified the need for mandatory EIAs for major dam, canal and diversion projects.

The proposed Act would also establish criteria and a process for screening other activities with potentially adverse environmental effects, including activities requiring an approval under the ***Water Resources Act***. This screening process would allow Directors of Alberta Environment to refer proponents of proposed activities with potential environmental impacts to the Environmental Assessment Division. The Environmental Assessment Division would then be required to review the proposal to determine whether the proponent warrants consideration under the Environmental Assessment process. During this screening, anyone who would be directly affected by the proposed activity could submit a letter of concern for consideration of the Director. Once the screening has been completed, the Director of the Environmental Assessment Division would be required to prepare a screening report outlining the reasons for requiring or not requiring an EIA.

The Minister of Environment may also order an EIA for any activity with potential adverse environmental effects.

The proposed Environmental Assessment process would also allow for public notice of all activities under review; public input into developing terms of reference for EIAs; public notice and access to completed EIA reports; and the opportunity for interested and affected parties to participate in public hearings required for major or controversial projects. The proposed legislation would also require proponents to provide information on a wide range of matters in the EIA report. This would include a description of the project; the need for the project; existing baseline conditions; practical alternatives; siting alternatives; likely environmental impacts; social, cultural, health and economic effects; cumulative effects; effects caused by normal operations and by accidents; mitigation strategies; monitoring plans; and public consultation.

After the EIA report has been completed to the satisfaction of Alberta Environment, the proponent will be referred to one of two boards for an independent review of the proposal or the EIA report will be submitted to the Minister of Environment. Major non-energy projects subject to mandatory review in the proposed Act will be referred to the recently created Natural Resources Conservation Board (NRCB). Major energy-related projects will continue to be referred to the ERCB. Revisions will, however, be made to the ***Energy Resources Conservation Act*** to ensure

Printed on Recycled Paper

that reviews are carried out in a consistent manner by both the ERCB and the NRCB. Environmental Impact Assessment reports prepared for other proposals would be submitted to the Minister. The Minister may, however, recommend to the Lieutenant Governor in Council that such projects be referred to the NRCB for review.

The NRCB has been established under a separate Act, the ***Natural Resources Conservation Board Act***. The NRCB is intended to provide an impartial process for the systematic and comprehensive review of non-energy projects that will or may affect the environment. The Board will have broad authority for approving, rejecting or modifying proposed resource development projects. Submissions to the NRCB will be subject to full public disclosure, affording the public opportunities to review applications.

Any NRCB decision that rejects or defers consideration of an approval cannot be overturned by the Government. If the NRCB approves a project, however, it must still be approved by Cabinet.

The purpose of the Environmental Assessment process is to ensure that only environmentally sound projects proceed into the development phase. Proposed projects would be rejected at the end of the Environmental Assessment process if they were deemed to be environmentally unsustainable, or if negative environmental impacts could not be mitigated. Projects successfully completing the Environmental Assessment process would be subject to resource-use and environmental approval requirements. Such approvals would not be granted until the Environmental Assessment process is complete.

The proposed AEPEA also contains provisions for carrying out joint environmental assessments with the federal government or other provincial governments.

ISSUES

Scientific Limitations

Often the ability to predict impacts is constrained by our limited understanding of physical and ecological processes. For example, extensive assessment studies failed to predict the accumulation of mercury in fish as a result of development of the South Indian Lake hydro-electric project in northern Manitoba.

There is a need for ongoing research, programs to collect baseline information and post-project monitoring to expand the horizons of applied ecology and its application to environmental assessment.

Cumulative Effects

As greater demands are placed on our water resources, cumulative effects assessment will become of greater importance; thus, effective management tools will have to be developed to deal with this issue. The draft AEPEA addresses the consideration of cumulative effects in an EIA. Such an assessment may, however, be difficult, if not impossible to achieve in the context of a traditional, project-level EIA. Such difficulty reflects the complexity and time and space horizons often associated with cumulative effects. Recent reviews suggest that cumulative effects can be addressed only in broader-based environmental and resource-management planning administered by government agencies.

- How should cumulative effects assessment be incorporated into broader-based planning studies?

FUTURE DIRECTIONS—ENVIRONMENTAL ASSESSMENT AND SUSTAINABLE DEVELOPMENT

The reports of the World Commission on Environment and Development and the National Task Force on Environment and Economy, both released in 1987, have focused attention on the urgency and importance of achieving sustainable forms of development which meet human needs and do not foreclose the environmental and socio-economic options of present and future generations. Underlying these reports is the recognition that uncontrolled economic development is severely degrading the ecological integrity of natural systems which support life on the planet. These reports identify environmental assessment and related procedures as key mechanisms for translating the principles and criteria of sustainable development into strategy and action.

The concept of sustainable development is embraced in the Alberta Government's environmental principles and policies outlined in the document "Alberta's Environment - Toward the 21st Century". The Environmental Assessment process is identified in this document as one of the tools for achieving sustainable development. The proposed AEPEA directly links environmental sustainability, to the Environmental Assessment process. Future resource proposals will be rejected if they do not meet the criteria of environmental sustainability or if significant impacts cannot be mitigated. There is, however, a need to increase the effectiveness of environmental assessment by expanding its scope beyond traditional project-level review to broader-based resource management planning initiatives.

To a certain extent, environmental assessment has been incorporated into Government resource planning activities. In recent years, Alberta Environment, in conjunction with other agencies, has formulated water management plans that integrate environmental protection with opportunities for water resource development. Extensive environmental research has been undertaken to develop the Cold Lake-Beaver River Water Management Study, the South Saskatchewan River Basin Planning Program, Instream Flow Needs studies currently being carried out on streams in South Saskatchewan River basin and lake management plans. The formal Environmental Assessment process has also been extended recently beyond the project level with the application of the process to the Highwood River Water Management Plan.

The challenge that lies ahead will be to develop effective procedures at all levels of decision-making that link economic development to environmental protection and the maintenance of ecological integrity. By so doing, we can achieve the goal of sustainable development, ensuring our common future on the planet.

Printed on Recycled Paper